

DPF Report 2013-2014

Ian Shipsey, Nicholas Hadley, JoAnne Hewett, Jonathan Rosner

(DPF Chair line);

Mike Tuts (Councillor);

Howard Haber (Secretary/Treasurer);

Yuri Gershtein, Nikos Varelas, Bob Bernstein, Sally Seidel,

Robin Erbacher, Laura Reina (Members-at-Large)

Division of Particles and Fields

American Physical Society

Outstanding Questions in Particle Physics *circa* 2014

... there has never been a better time to be a particle physicist!

Higgs boson and EWSB

- ☐ m_H natural or fine-tuned ?
 - if natural: what new physics/symmetry?
- ☐ does it regularize the divergent $V_L V_L$ cross-section at high $M(V_L V_L)$? Or is there a new dynamics ?
- ☐ elementary or composite Higgs ?
- ☐ is it alone or are there other Higgs bosons ?
- ☐ origin of couplings to fermions
- ☐ coupling to dark matter ?
- ☐ does it violate CP ?
- ☐ cosmological EW phase transition

Dark matter:

- ☐ composition: WIMP, sterile neutrinos, axions, other hidden sector particles, ..
- ☐ one type or more ?
- ☐ only gravitational or other interactions ?

The two epochs of Universe's accelerated expansion:

- ☐ primordial: is inflation correct ?
 - which (scalar) fields? role of quantum gravity?
- ☐ today: dark energy (why is Λ so small?) or gravity modification ?

Quarks and leptons:

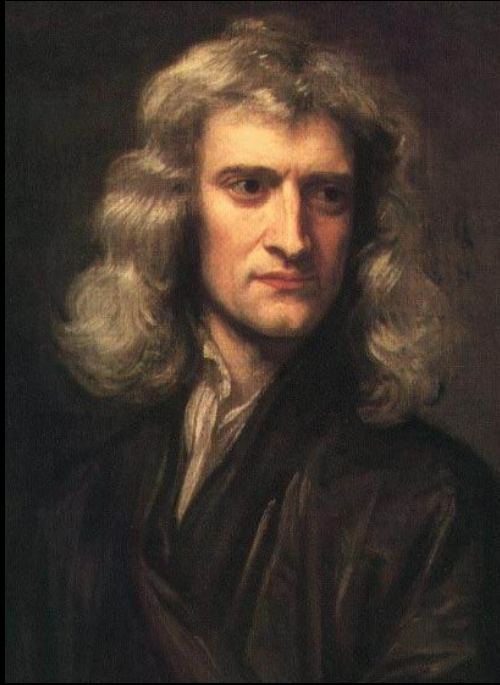
- ☐ why 3 families ?
- ☐ masses and mixing
- ☐ CP violation in the lepton sector
- ☐ matter and antimatter asymmetry
- ☐ baryon and charged lepton number violation

Physics at the highest E-scales:

- ☐ how is gravity connected with the other forces ?
- ☐ do forces unify at high energy ?

Neutrinos:

- ☐ ν masses and their origin
- ☐ what is the role of $H(125)$?
- ☐ Majorana or Dirac ?
- ☐ CP violation
- ☐ additional species → sterile ν ?



“What we know is a droplet, what we
don’t know is an Ocean”

Sir Isaac Newton (1643-1727)

Building for Discovery

Strategic Plan for U.S. Particle Physics in the Global Context

Report of the Particle Physics Project Prioritization Panel (P5)



<http://science.energy.gov/hep/hepap/reports/>

We have a great plan with enthusiastic and broad community support

Building for Discovery

Strategic Plan for U.S. Particle Physics in the Global Context

Report of the Particle Physics Project Prioritization Panel (P5)



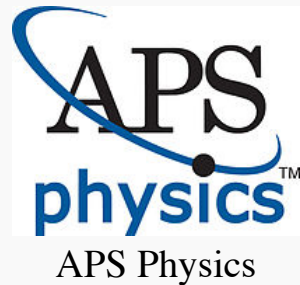
<http://science.energy.gov/hep/hepap/reports/>

We have a great plan with enthusiastic and broad community support

**Community engagement through DPF's Snowmass Study has been
crucial to bring us to this point**

APS & DPF

American Physical Society

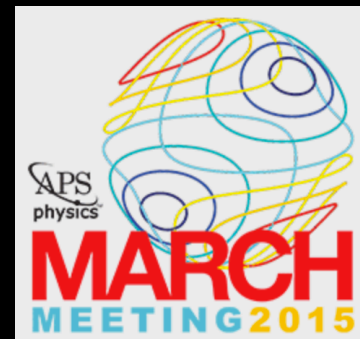


| | |
|---------------------|---|
| Abbreviation | APS |
| Formation | May 20, 1899 |
| Type | Scientific |
| Purpose | To advance and diffuse the knowledge of physics |
| Location | American Center for Physics College Park, MD, USA |
| Membership | 50,000 |
| Website | http://www.aps.org/ |

Second largest physics society in the World

The Society serves the physics Community through the organization of technical meetings and publication of journals.

APS publishes more than a dozen scientific journals, including *Physical Review* and *Physical Review Letters*, and organizes more than 20 science meetings each year in particular the March and April Meetings



APS: 14 divisions (ex: DPF) and 11 topical groups covering all areas of physics
6 forums that reflect the interest of members in broader issues
9 sections organized by geographical region

APS is active in public and governmental affairs, and in the international physics community. In addition, extensive programs in education, science outreach (specifically Physics Outreach), and media relations.

2013



Renewing Licenses for the Nation's Nuclear Power Plants

December 2013

A Report by the APS Panel on Public Affairs.



A Technical Review: The Domestic Nuclear Detection Office Transformational and Applied Research Directorate R&D Program

August 2013

A Report from the APS Panel on Public Affairs Committee and the IEEE.



U.S.-Russian Nuclear Reductions After New START: Summary of a Workshop Exploring Next Steps

June 2013

A Report from the APS Panel on Public Affairs Committee and the Center for Strategic and International Studies (CSIS).



American Physical Society Sites

Division of Particles & Fields

3,500 members

The objective of the Division is the study of fundamental particles and fields, their structure, their interactions and interrelationships, the design and development of high energy accelerators, and the design and development of instrumentation techniques for high energy physics.

Executive Committee

Chair: [Ian Peter Shipsey](#) (01/14 - 12/14)
Purdue Univ

Chair-Elect: [Nicholas Hadley](#) (01/14 - 12/14)
Univ of Maryland-College Park

Vice Chair: [Joanne Hewett](#) (01/14 - 12/14)
SLAC - Natl Accelerator Lab

Past Chair: [Jonathan Rosner](#) (01/14 - 12/14)
Univ of Chicago

Secretary/Treasurer: [Howard Haber](#) (01/13 - 12/15)
Univ of California-Santa Cruz

Councillor: [Philip Tuts](#) (01/14 - 12/17)
Columbia Univ Nevis Lab

Member-at-Large: [Yuri Gershtein](#) (01/12 - 12/14)
Rutgers Univ

Member-at-Large: [Nikos Varelas](#) (01/12 - 12/14)
Univ of Illinois - Chicago

Member-at-Large: [Robert Bernstein](#) (01/13 - 12/15)
Fermilab

Member-at-Large: [Sally Seidel](#) (01/13 - 12/15)
Univ of New Mexico

Member-at-Large: [Robin Erbacher](#) (01/14 - 12/16)
Univ of California - Davis

Member-at-Large: [Laura Reina](#) (01/14 - 12/16)
Florida State Univ

Committees



American Physical Society Sites

Division of Particles & Fields

Committee Memberships are appointed by the DPF chair with the advice of the DPF Exec

Snowmass Organizing Committee

P5 Rollout Campaign Committee (joint with FNAL UEC, US LHC UA, SLUO)

Community Visit to Capitol Hill Committee

Coordinating Panel on Advanced Detectors

APS Fellowships

Panofsky Prize (Expt.)

Sakurai Prize (Thy.)

Primakoff Award (Young scientist)

Tanaka Dissertation Award (Expt.)

JJ. & Noriko Sakurai Dissertation Award (Thy.)

Mentoring Award

Instrumentation Award

Nominating

April Meeting DPF Program

Divisional Meeting (biannual)

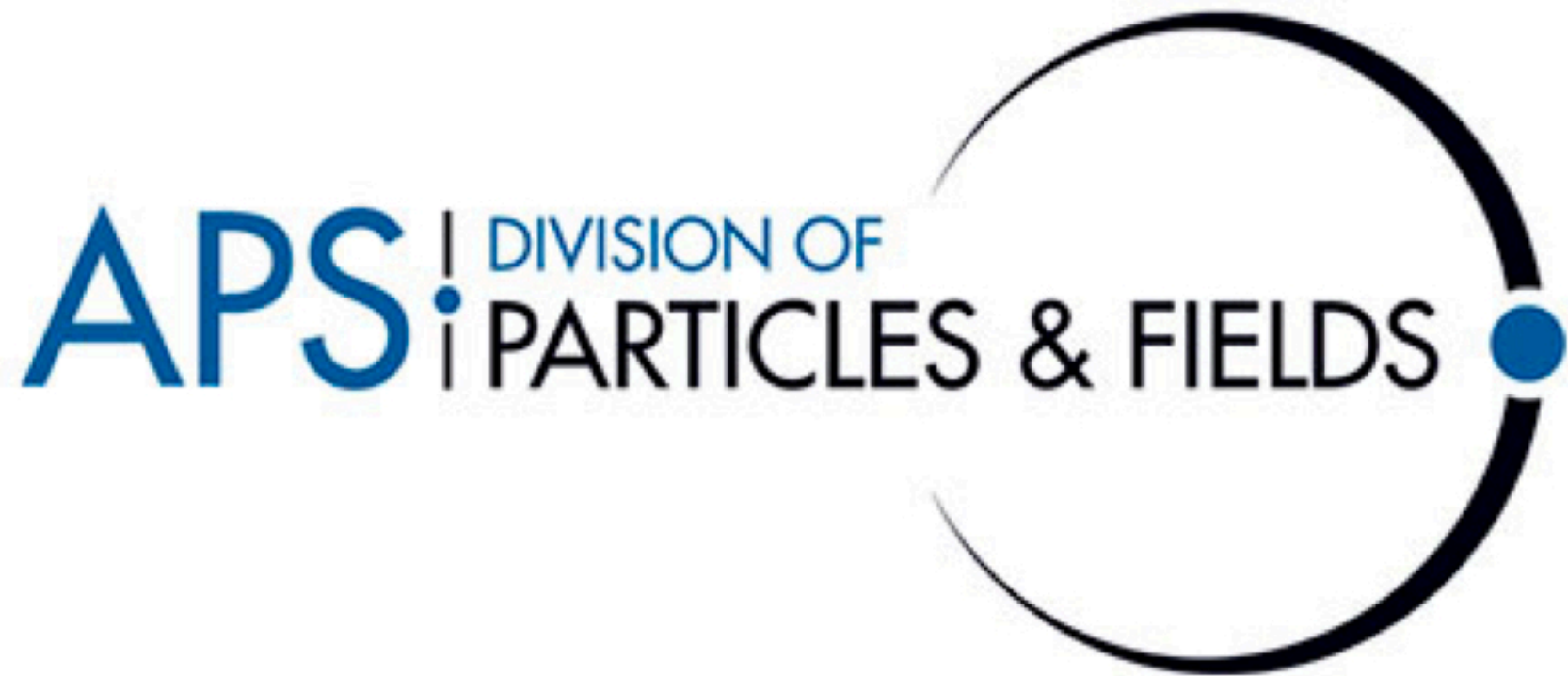
Ex-officio one member of DPF chairline
on ECFA, ICFA, HEPAP

Membership in various APS committees

Advisory on PRL and PRD Editorial Board

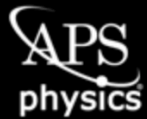
Appointments

A national competition resulted in a new logo



DPF Newsletter

Continuously updated at
<http://dpfnewsletter.org>



APS DIVISION OF PARTICLES AND FIELDS
NEWSLETTER

Search...



FEATURED STORIES



OCTOBER 13, 2014



SEPTEMBER 25, 2014



SEPTEMBER 9, 2014

Welcome to DPFNEWSLETTER.ORG

This is the official newsletter site for the Division of Particles and Fields of the American Physical Society.

All posts (in Reverse Chronological Order)

- Request for Community Input to the Coordinating Panel for Advanced Detectors
- September 2014 News
- The Community Letter in Support of the P5 Report
- Community Presentation of the P5 Report by Steve Ritz on June 2, 2014, at 12:30 PM EDT
- April 2014 News
- DPF Logo Competition: your design is needed!
- Announcement of TASI-2014
- Results of the 2013 DPF elections
- 2013 APS Fellows

DPF Newsletter

<http://dpfnewsletter.org>

+ A traditional posting of topical items three times a year both to the DOE membership & @ the Newsletter page

The screenshot shows the homepage of the DPF Newsletter website. At the top, there is a dark header with the APS physics logo on the left, the text "APS DIVISION OF PARTICLES AND FIELDS NEWSLETTER" in the center, and a search bar on the right. Below the header, there are social media icons for RSS and Facebook. The main content area is divided into two columns. The left column features the "September 2014 News" section, which includes the date "SEPTEMBER 25, 2014", the author "BY DPFNEWSLETTER", and a list of topics such as "Our New Logo!", "DPF Facebook Page", and "New Bylaws and Young Person Member". The right column contains a "Welcome to DPFNEWSLETTER.ORG" message and a list of "All posts (in Reverse Chronological Order)", including "Request for Community Input to the Coordinating Panel for Advanced Detectors" and "September 2014 News". A yellow banner at the bottom right of the page reads "December issue out next week".

APS physics

APS DIVISION OF PARTICLES AND FIELDS
NEWSLETTER

Search...

September 2014 News

BY DPFNEWSLETTER – SEPTEMBER 25, 2014
POSTED IN: FRESH, NEW

DPF Newsletter September, 2014
By the DPF Chairline, Executive Committee, and guest writers

In this issue:

- [Our New Logo!](#)
- [DPF Facebook Page](#)
- [New Bylaws and Young Person Member](#)
- [Russian Travel Situation](#)
- [Membership Vote Approaching on APS Governance Changes](#)
- [Save the Date!](#)

[Download this newsletter in .pdf format](#)

Welcome to DPFNEWSLETTER.ORG

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December issue out next week


- 2013 APS Fellows

The “Snowmass” Process Oct. 2012-Oct. 2013

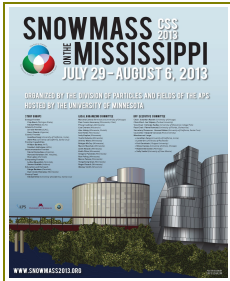
The main activity of the DPF from early 2012 when planning began, until October 2013 was the Snowmass process

CSS2013
July 29 - August 6, 2013

HomeRegistrationScheduleDPF wikiEventsDirectionsContact Us



Snowmass on the Mississippi (July 29 - August 6, 2013)



[Archive of video streaming during the snowmass](#)

Charge: The American Physical Society's Division of Particles and Fields is initiating a long-term planning exercise for the high-energy physics community. Its goal is to develop the community's long-term physics aspirations. Its narrative will communicate the opportunities for discovery in high-energy physics to the broader scientific community and to the government.

Physics Slam on Ice! [YouTube video link](#)

A science competition so hot, they had to put it on ice! Watch six physicists battle for the audience's applause, hoping to emerge the champion of science entertainment. Contestants will have 10 minutes to explain their research to the audience; the winner will be determined by an applause meter.

[Physics Slam webpage](#)

Snowmass Public Lecture by Prof. Saul Perlmutter

8 pm on Monday, July 29 [Supernovae, Dark Energy, and Our Accelerating Universe](#)

For Conveners

Conveners, to request room for parallel session use this link [Request rooms !!!](#)

Schedule is now available at [Schedule](#).

A document with a step by step instruction how to upload a presentation to the indico service: [Instructions for Indico uploading](#). If your upload fails, please visit the help desk for assistance.

Useful Links

Home

Registration

Registrant List

DPF Wiki (Details about the Snowmass Process)

Events

Snowmass for Families (NEW!)

Directions & Parking

Accommodations

Local Attractions

Contact Us

APS Physics | DPF | Executive Committee

Local Organizing Committee

The community asked:

What does a healthy particle physics program in the US look like?

The community answered that some of the essential ingredients are:

A program focused on the most compelling science

Infrastructure to support the development of our tools

A long term vision and strategy to guide the program for future decades.

The “Snowmass” Process Oct. 2012-Aug. 2013



- >1,000 physicists contributing in the US and globally. A vast number of scientific opportunities were investigated, discussed, and summarized in the Snowmass reports.
- It was essential input and a starting point for P5

See <http://www.hep.umn.edu/css2013/>
& <http://www.slac.stanford.edu/econf/C1307292/>

The Snowmass Proceedings

Planning the Future of U.S. Particle Physics

Report of the 2013 Community Summer Study

Conveners: M. Bardeen, W. Barletta, L. A. T. Bauerdick, R. Brock, D. Cronin-Hennessy, M. Demarteau, M. Dine, J. L. Feng, M. Gilchriese, S. Gottlieb, J. L. Hewett, R. Lipton, H. Nicholson, M. E. Peskin, S. Ritz, I. Shipsey, H. Weerts

Division of Particles and Fields Officers in 2013: J. L. Rosner (chair and corresponding author), I. Shipsey (chair-elect), N. Hadley (vice-chair), P. Ramond (past chair)

Editorial Committee: R. H. Bernstein, N. Graf, P. McBride, M. E. Peskin, J. L. Rosner, N. Varelas, K. Yurkewicz

A resource book, similar to the Physics Briefing Book of the European Strategy Group, conveying the health and diversity of the field in the US in a global context.

Ex

[1. Summary of the 2013 Community Summer Study](#)

If

[2. Intensity Frontier](#)

Ef

[3. Energy Frontier](#)

Cf

[4. Cosmic Frontier](#)

Th

[5. Theory](#)

Ac

[6. Accelerator Capabilities](#)

Uc

[7. Underground Laboratory Capabilities](#)

In

[8. Instrumentation](#)

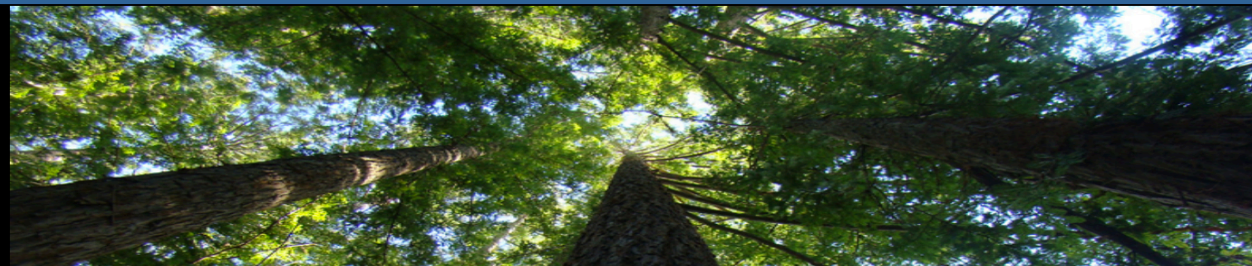
Co

[9. Computing](#)

Ed

[10. Communication, Education, and Outreach](#)

2013 **DPF**
UC SANTA CRUZ



Not every one could be at Snowmass, more of the community was informed & engaged by the biannual Divisional Meeting at Santa Cruz held the week after Snowmass

What Snowmass did:

Evaluated by benchmarking
Speculated by calculating
Dreamed about following the physics
Propose the methods and experiments
to make discoveries

What Snowmass did not do:

Set priorities
That job was for P5

As P5 conducted its work we organized: DPF Community Visit to Capitol Hill
to celebrate the Higgs boson discovery and other recent discoveries in particle physics
to apprise Congress of the leading role of US scientists in the Higgs discovery at the LHC,
the ongoing Snowmass/P5 process & the exciting opportunities that lie ahead for the field.



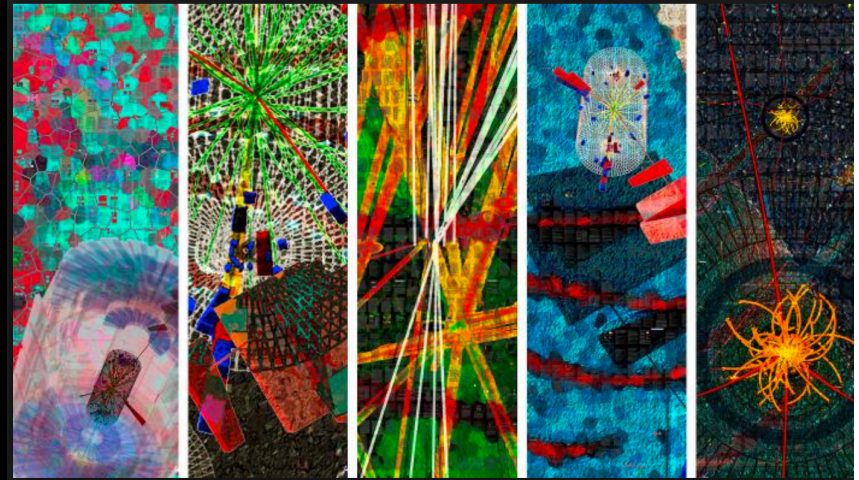
Organized by the Community Visit to Capitol Hill Committee

Components: multiple parallel congressional visits during the day and a reception in the evening

Origin of the idea and model for the event: visits to Capitol Hill by the LSST collaboration 4/2012 and 4/ 2013

Pre-event:

Museum quality plexiglass prints by Xavier Cortada (FIU) portraying Higgs discovery & invitations to the reception, hand-delivered to 435 House offices, and most of the Senate offices. Consequently, those offices were very much aware of, and enthusiastic about, the visit.



On November 20, many members of our community met with their congressional representatives and/or their staffers on Capitol Hill. (38 institutions participated.) For many, this was the first time making such visits and they found it a good experience.

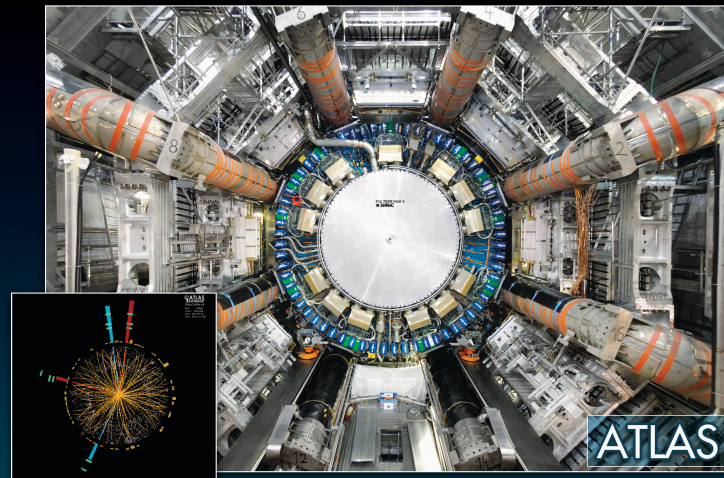
sponsorship: APS Office of the President, DPF, URA, FRA

hosted by: the House Science & National Labs Caucus

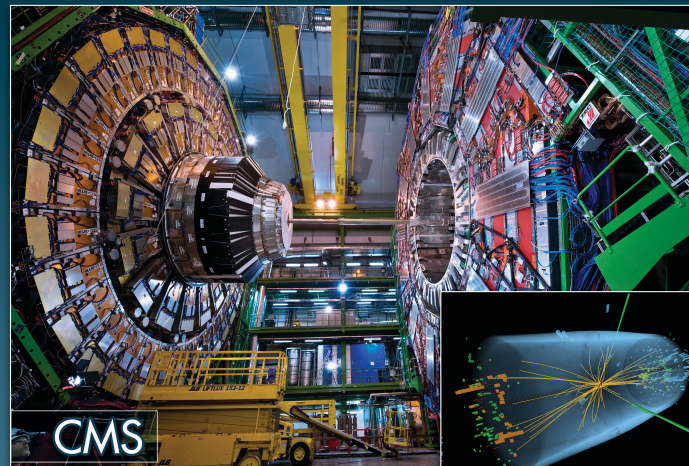
THE HIGGS BOSON DISCOVERY AT THE LHC

1500 U.S. faculty, scientists, and students participated in the discovery of the Higgs boson.

- University of Alabama • Argonne National Laboratory • University of Arizona • Baylor University • Boston University • Brandeis University • Brookhaven National Laboratory • Brown University • University of California, Berkeley • University of California, Davis • University of California, Irvine • University of California, Los Angeles • University of California, Riverside • University of California, San Diego • University of California, Santa Barbara • University of California, Santa Cruz • California Institute of Technology • California State University, Fresno • Carnegie Mellon University • University of Chicago • University of Colorado • Columbia University • Cornell University • Duke University • Fairchild University • Fermi National Accelerator Laboratory • University of Florida • Florida Institute of Technology • Florida International University • Florida State University • Hampton University • Harvard University • University of Illinois at Chicago • University of Illinois at Urbana-Champaign • Indiana University • University of Iowa • Iowa State University • Johns Hopkins University • University of Kansas • Kansas State University • Lawrence Berkeley National Laboratory • Lawrence Livermore National Laboratory • Louisiana Tech University • University of Maryland • University of Massachusetts, Amherst • Massachusetts Institute of Technology • University of Michigan • Michigan State University • University of Minnesota • University of Mississippi • University of Nebraska-Lincoln • University of New Mexico • State University of New York at Albany • State University of New York at Buffalo • State University of New York at Stony Brook • New York University • Northeastern University • Northern Illinois University • Northwestern University • University of Notre Dame • Ohio State University • University of Oklahoma • Oklahoma State University • University of Oregon • University of Pennsylvania • University of Pittsburgh • Princeton University • University of Puerto Rico • Purdue University • Purdue University Calumet • Rice University • University of Rochester • Rockefeller University • Rutgers University • SLAC National Accelerator Laboratory • University of South Carolina • Southern Methodist University • University of Tennessee • Texas A&M University • University of Texas at Arlington • University of Texas at Austin • University of Texas at Dallas • Texas Tech University • Tufts University • Vanderbilt University • University of Virginia • University of Washington • Wayne State University • University of Wisconsin-Madison • Yale University

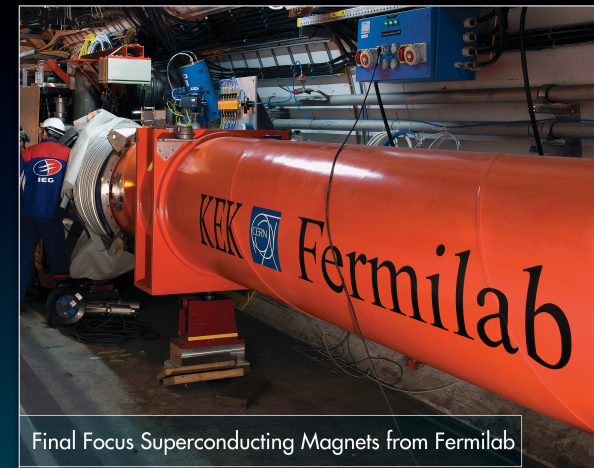


ATLAS



CMS

The US CMS and US ATLAS programs are supported by the Department of Energy (DOE) Office of Science and the



Final Focus Superconducting Magnets from Fermilab



Beam Separation Superconducting Dipoles from BNL

Four US laboratories participate in the LHC Accelerator Construction and Research Program supported by the DOE Office of Science: Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkeley National

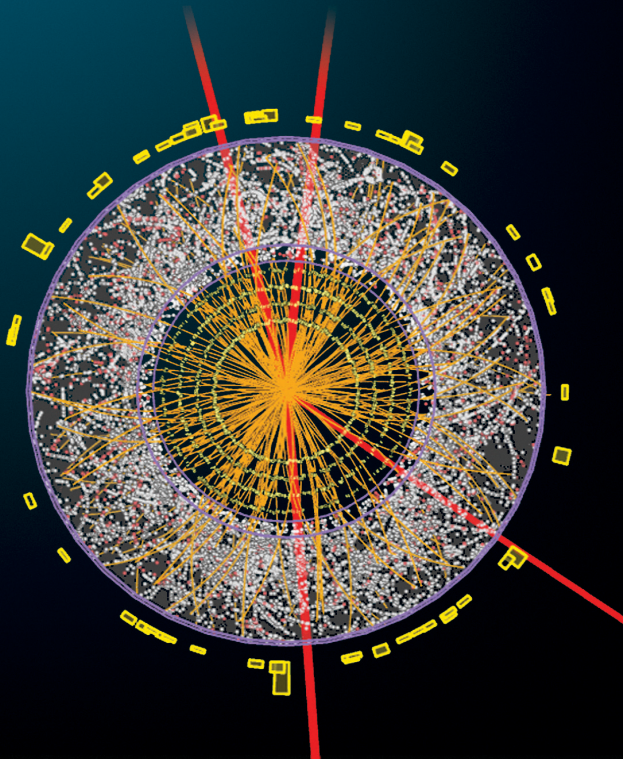
Poster made for the Capitol Hill Community Visit

July 4, 2012: Discovery!

October 8, 2013: Nobel Prize!

Groups from across the United States played critical roles in the design and construction of the experiments and the teasing out of the Higgs Boson from the data.

The Higgs Boson was the single missing piece in the 40-year-old Standard Model of Particle Physics. Its confirmation reveals it to be a real particle with mysterious properties.



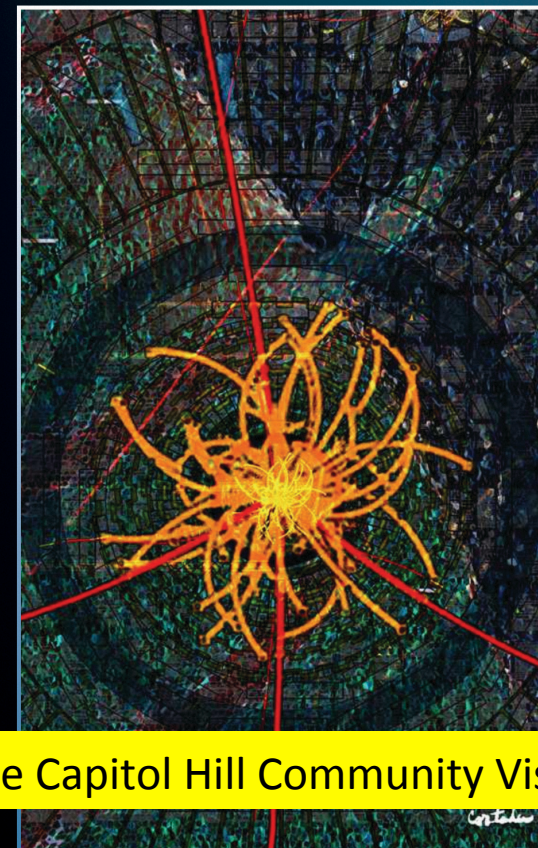
WHO found the Higgs Boson?

In the US, 1500 faculty, scientists, and students from 90 universities and labs:

- University of Alabama • Argonne National Laboratory
- University of Arizona • Baylor University • Boston University • Brandeis University • Brookhaven National Laboratory • Brown University • University of California, Berkeley • University of California, Davis • University of California, Irvine • University of California, Los Angeles • University of California, Riverside • University of California, San Diego • University of California, Santa Barbara • University of California, Santa Cruz • California Institute of Technology • California State University, Fresno • Carnegie Mellon University • University of Chicago • University of Colorado • Columbia University • Cornell University • Duke University • Fairfield University • Fermi National Accelerator Laboratory • University of Florida • Florida Institute of Technology • Florida International University • Florida State University • Hampton University • Harvard University • University of Illinois at Chicago • University of Illinois at Urbana-Champaign • Indiana University • University of Iowa • Iowa State University • Johns Hopkins University • University of Kansas • Kansas State University • Lawrence Berkeley National Laboratory • Lawrence Livermore National Laboratory • Louisiana Tech University • University of Maryland • University of Massachusetts, Amherst • Massachusetts Institute of Technology • University of Michigan • Michigan State University • University of Minnesota • University of Mississippi • University of Nebraska-Lincoln • University of New Mexico • State University of New York at Albany • State University of New York at Buffalo • State University of New York at Stony Brook • New York University • Northeastern University • Northern Illinois University • Northwestern University • University of Notre Dame • Ohio State University • University of Oklahoma • Oklahoma State University • University of Oregon • University of Pennsylvania • University of Pittsburgh • Princeton University • University of Puerto Rico • Purdue University • Purdue University Calumet • Rice University • University of Rochester • Rockefeller University • Rutgers University • SLAC National Accelerator Laboratory • University of South Carolina • Southern Methodist University • University of Tennessee • Texas A&M University • University of Texas at Austin • University of Texas at Dallas • Tufts University • Vanderbilt University • University of Virginia • University of Washington • Wayne State University • University of Wisconsin-Madison • Yale University

THE HIGGS BOSON

and Particle Physics
in the United States



Three-fold made for the Capitol Hill Community Visit

Headline talks: Joe Incandela CMS & Dave Charlton ATLAS
Congressman Hultgren (IL), Foster (IL), Holt (NJ), Fattah (PA) , Nunelee (MS). All spoke enthusiastically about particle physics and science in general. Non-speaking: Capps CA; Swalwell (CA), DeFazio (OR), Yoho (FL) McNerney (CA).
Philip Rubin, Principal Assistant Director for Science at OSTP in the executive office of the President, communicated congratulations from the President.
Master of ceremonies: Pushpa Bhat



Connection to the P5 Report, excerpt from remarks at the Higgs Celebration:

...particle physics is taking stock to determine an optimal strategy for the future of the field, in Asia, and Europe and in the US where **our community has just completed a nine month study that lays out the opportunities for further discovery** and these are now being evaluated by the High Energy Physics Advisory Panel of the DOE and NSF. A strategy for US particle physics in a global context will be the result and our community will speak with one voice in support of that strategy. The strategy will likely include continued US leadership at the LHC but also for the US to host a world leading facility at FNAL that will study neutrinos. The FNAL facility will be a must go to destination for physicists based in Europe and Asia. *We would like to come back to the Rayburn Building once the P5 Report is complete to tell you about this strategy for US particle physics* I. Shipsey (for the DPF)

These remarks were well received. Members said: “please come back!”



The Rayburn Foyer was overfull, very positive and enthusiastic atmosphere: congressional staffers, particle physicists, Agency leaders from DOE and NSF. Bill Colglazier, Science Advisor to the Secretary of State, and Norm Neureiter of AAAS, Nobel Laureate John Mather of NASA, Jerry Guralnik and Carl Hagen, high schools students and their physics teacher from the QuarkNet program.

Michael Turner, APS President -

"Congratulations! The event you put on last night was a huge success. The Rayburn Foyer was cramped with people with enthusiasm and energy. This event made HEP, physics, the DPF and APS look good and that much focus on science in the Capitol was a very good thing for science as well. We can all be proud of last night."

Kate Kirby, APS Executive Officer -

"You and your organizing team are to be congratulated on a truly wonderful event on Capitol Hill yesterday! It was a great day for particle physics, and I hope just the beginning of increased attention from supporters of basic science in Congress. We need to continue to build on this event and to broaden our base of support.

Thank you to the entire High Energy/Particle Physics community, who, turned out in full force.

Tyler Glembo, APS Government Relations Office -

"I would like to add that I've received multiple calls today from Congressional offices interested in talking about the event, getting more information, giving congratulations, and also simply thanking us for the hard work that has been done. The event was incredibly well received on the hill and I have heard nothing but positive feedback."

Marta Cehelsky, URA -

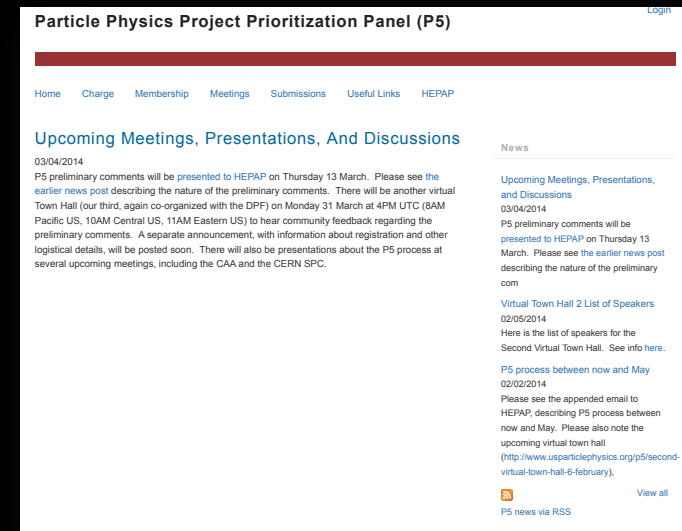
"Warmest congratulations! It was a fine event last night, well attended, and the Members hanging in for almost the entire program."

DPF are very grateful to the Higgs Event Organizing Committee and many others who made this event possible.

Tom Abel (Stanford/SLAC), Drew Baden (Maryland), Michael Barnett (LBNL), Pushpa Bhat (co-Chair, FNAL), Jim Brau (Oregon), Chip Brock (MSU), Sally Dawson (BNL), Dmitri Denisov (FNAL), Jonathan Feng (UCI), Bonnie Fleming (Yale), Howard Gordon (BNL), Kevin Lesko (LBNL), Joe Lykken (FNAL), Harvey Newman (Caltech), Rob Roser (FNAL), Ian Shipsey (co-Chair, Purdue), Michael Tuts (Columbia), Nikos Varelas (UIC), Harry Weerts (ANL), Herman White (FNAL)

Community input continued during P5 Process

- Continuous effort to maximize community interactions by P5 & DPF
- Three big, open, topical meetings & input Portal
- DPF & P5 organized Virtual Community Town Halls a new modality for HEP



<http://interactions.org/p5>

P5 Rollout Campaign Committee - formed April 2014

DPF EC + FNAL UEC + US LHC UA + SLUO

HEPAP unanimously accepted
the report on 22 May 2014

Organized:

Virtual and physical town halls to coincide with the P5 Rollout

Senate Briefing

Community Letter

Senate Briefing Sponsored by Committee on
Energy and Natural Resources: P5 plan by
Steve Ritz and Q&A; Brief remarks by Bagger,
Wilson, Baden, Bhat



Image credit: Herman White

The Community backs the P5 Report

Dear Secretary Moniz,

We write as members of the US Particle Physics Community to inform you that the P5 report has an unprecedented level of support in our community.

Recently the Division of Particles and Fields of the American Physical Society and the Users Organizations of Fermilab, SLAC and US LHC prepared a letter in support of the P5 report from the U.S. Particle Physics Community. We then contacted the community, asked them to read the P5 report if they had not already done so, and if they agreed with the report (and if they are affiliated with a U.S. institution) to read and sign the letter. In the following seven days 2,095 members of our community signed.

The letter is here:

https://dl.dropboxusercontent.com/u/24655052/P5_CommunityLetter_toDOEandNSF3.pdf

Best regards,

Ian Shipsey Puspha Bhat Chip Brock Nick Hadley

For the HEP Community P5 Rollout Organizing Committee

Daniel Akerib, Robert Bernstein, Pushpa Bhat (Co-Chair), Edward

2,331 members of the community signed a letter of support for the P5 report addressed to DOE and NSF.

Community Letter sent to the Secretary of Energy & NSD Director June 23, 2014

http://dpfnewsletter.org/wp-content/uploads/2014/09/P5_CommunityLetter_DOE.pdf

Final Signatories List

http://dpfnewsletter.org/wp-content/uploads/2014/09/signatories_list-final.pdf

The Community backs the P5 Report

The Honorable Ernest Moniz
Secretary
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Mr. Secretary:

During the late summer of 2013, the DOE and NSF charged the High Energy Physics Advisory Panel (HEPAP) to constitute a new Particle Physics Project Prioritization Panel (P5) with a goal of developing a 10-year strategic plan for U.S. particle physics in the context of a 20-year global vision. P5 recently completed its work and its report was unanimously endorsed by HEPAP on May 22, 2014. As scientists, engineers, and students from 144 U.S. universities and laboratories, we write to express our strong support for the P5 Report.¹ This plan describes a world-leading program of discovery and we urge that it be incorporated into the plans of the DOE and the NSF.

The report proposes a compelling and balanced strategy of exploration and discovery. The funding profile is realistic. By following it, we will maintain our historic position as a global leader and reliable international partner in this exciting science. The plan invests in the strengths of the US Particle Physics Community, optimizing our resources to address the five critical and intertwined science drivers identified by P5: to exploit the Higgs boson as a new tool for discovery; to pursue the physics associated with neutrino mass; to identify the physics of dark matter; to understand cosmic acceleration, dark energy and inflation; and to explore the unknown, new particles, new interactions, and the principles that govern them.

The P5 report relies on the work of an extensive community study (“Snowmass”) commissioned by the Division of Particles and Fields of the American Physical Society, our professional society of particle physics. Over the course of a year a thousand members of our community, organized in dozens of far-flung working groups, considered the scientific opportunities in depth covering all areas of our field. This work culminated in a 10-day meeting in August 2013 where the comprehensive documentation for P5’s deliberations was completed. Then over the subsequent nine months, P5 held multiple face-to-face and virtual community meetings, and maintained an active website for community input. The resulting P5 report distilled the accumulated wealth of scientific opportunities into those that best serve the science drivers, while also making hard choices among many outstanding scientific programs. Support among our community has solidified behind this exciting report as witnessed by our attached **2095 signatures gathered in seven days**: we stand behind the P5 plan.

Now that our community has reached consensus, we look to you for the necessary support to execute this plan that will enable us to maintain and enhance our position as global leaders in this exciting program of discovery science and technological innovation.

Sincerely,
The U.S. Particle Physics Community

NSF Responds

I appreciate hearing the voice of the particle physics community in the P5 Rollout Campaign. The High Energy Advisory Panel unanimously endorsed the report, “Building for Discovery: Strategic Plan for US Particle Physics in the Global Context”, which lays out a vision for the next decade of US particle physics. **The support of the more than 2000 members of the community who signed the letter is a strong and broad endorsement of the plan. Such community support is a crucial requirement for realization of the vision in the report, and continuing conversations with the community are essential as we move forward.** I look forward to the involvement of many stakeholders as the discussions of the report and its implementation continue.

Best regards, Fleming

F. Fleming Crim

Assistant Director, National Science Foundation

Directorate for Mathematical and Physical Sciences

DOE Responds

“Thank you, the other members of the HEP Community P5 Rollout Organizing Committee and the over two thousand signatory members of the particle physics community, for expressing your support for the strategic objectives expressed in Building for Discovery: Strategic Plan for U.S. Particle Physics in the Global Context. The P5 report, as endorsed unanimously by the High Energy Physics Advisory Panel, presents a ten year strategic plan for U.S. Particle Physics in the context of a twenty year global vision for the field. The community’s endorsement of this plan is absolutely critical for its success.

As we plan for the future, the P5 report recommendations and the strong community support for them are forefront in our considerations.”

Patricia Dehmer

Office of the Director at the DOE Office of Science (DOE SC)

P5 Rollout Campaign Committee: more to come

Early stages of thinking about the best way to accept the invitation to return to Capitol Hill to talk about P5 and its compelling vision

Very preliminary
not yet widely discussed
1st meeting of organizing
committee next week

One idea:

LHC phase II & neutrinos the two “big asks: & a key part of the P5 plan

Particle Physics is Global

"US Particle Physics in a Global Age of Science and Discovery"

A community visit similar to the Nov, 2013 visit to Capitol Hill, featuring FNAL & CERN Leadership & partnership. Pre visit artwork tuned to the message
When? This time we don't have the Nobel Prize..... but

Possibly in conjunction with the APS April Meeting in Baltimore
Apr 11-14 2015 where there will be related plenary sessions and panels on “Big Science in the Global Age of Science & Discovery” featuring FNAL, CERN & NASA leadership. Visit to Capitol Hill would be April 14.

The DPF are very grateful to:

The US Particle Physics Community P5 Rollout Organizing Committee*

Daniel Akerib, Robert Bernstein, Pushpa Bhat (Co-Chair), Edward Blucher, James Brau, Raymond Brock, Sally Dawson, Robin Erbacher, Yuri Gershtein, Howard Haber, Nick Hadley, JoAnne Hewett, Harvey Newman, Nicola Omodei, Laura Reina, B. Lee Roberts, Jonathan Rosner, Sally Seidel, Ian Shipsey (Co-Chair), Michael Tuts, Breese Quinn, Michael Sokoloff, Nikos Varelas, Hendrik Weerts.

* The HEP Community P5 Rollout Committee is a joint committee of the Division of Particles and Fields of the American Physical Society and the Users Organizations of Fermilab, SLAC and US LHC.

SCOAP 3

Sept 18

Although Snowmass and P5 have been our main activity the DPF worked closely with the APS and CERN leaderships to facilitate the partnership to make all CERN-authored articles Open Access

<http://www.aps.org/publications/apsnews/updates/cern-aps.cfm>



CERN and APS announce partnership for Open Access

September 18, 2014

The American Physical Society (APS) and The European Organization for Nuclear Research (CERN) jointly announce a partnership to make all CERN-authored articles published in the APS journal collection to be Open Access.

Articles in APS' *Physical Review Letters*, *Physical Review D*, and *Physical Review C* in 2015 and 2016 will be covered by this agreement. All physics results from CERN will benefit from this partnership, in theoretical physics and experimental physics, at the LHC accelerator as well as other experimental programs.

"CERN is a long-time supporter of APS journals, and is committed to Open Access. This collaboration is a very important step towards global Open Access for a global discipline," said CERN Director General Rolf Heuer.

Although APS is not participating in the current cycle of SCOAP3, the global Open Access initiative in physics coordinated by CERN, this agreement demonstrates both organizations' commitment to Open Access publishing.

"It was important to continue our discussions with CERN, while keeping in mind the financial stability of the APS publishing program," said Mac Beasley, 2014 APS President. "This is a fitting solution that advances physics."

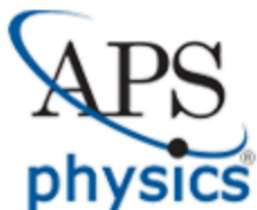
Statement on US Office of Management & Budget Travel Restrictions

December 9

To OMB cc Ernie Moniz, France Cordova, Jim Siegrist. Andy Lankford.

The Executive Committee of the Division of Particles and Fields (DPF) of the American Physical Society recognizes that the amount of federal funding available to support participation in conferences is limited. The US Office of Management and Budget (OMB) limits the amount of money one agency can spend on an individual conference. At the national laboratories this leads in effect to a quota on the number of scientists engaged in research in particle physics that can attend a particular conference. The DPF strongly opposes this restriction.

The DPF believes in the importance of conferences where people can meet and discuss ideas about the field. It is precisely the most interesting and useful conferences that our members wish to attend. By restricting the number of particle physicists from US national laboratories who can attend such conferences, the OMB is damaging the scientific productivity of our national laboratories, and, ultimately, damaging the scientific productivity of our nation.



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April Meeting 2015 • April 11 - 14 • Baltimore, Maryland

The APS April Meeting is heading to Baltimore, Maryland! This meeting will bring together physicists and students in astrophysics, gravitational physics, nuclear physics, and particle physics to share new research and insights at sessions sponsored by [participating units](#).

Abstract Submission

Now Open

Deadline: Friday, January 9, 2015 at 5:00 p.m. EST

► [Submit an Abstract](#)

Registration

Now Open

Ways to save, fees, and how to register.

► [Register Now](#)

Save on Registration

APS members save significantly on registration rates.

[Join now](#) or [renew your membership](#).

Hotel & Travel

Get reduced rates on hotels near the convention center making your reservations online.

► [Book Now](#)

[Travel Grants & Funding](#)

Venue: Hilton Baltimore Inner Harbor
Expected Sessions: ~75 Invited
Latest Research From: [19 APS Units](#)

51 invited DPF talks
+60 contributed talks
Session organized around the
five P5 Science Drivers

DPF2015

AUG 4-8 | ANN ARBOR, MI

Meeting of the **Division of Particles & Fields**
of the American Physical Society

**Three excellent bids
to host DPF2015
Ann Arbor selected**

HOSTED BY:
University of Michigan Department of Physics

PLENERY SESSIONS INCLUDE:

- Energy, Intensity and Cosmic Frontiers
- First Results from LHC Run-2

PARALLEL SESSIONS INCLUDE:

- Higgs Sector and EWSB
- New Physics Beyond the Standard Model
- Neutrino Physics
- Accelerators, Detectors, Computing
- Field and String Theory
- QCD
- Quark and Lepton Flavor
- Top Quark
- Outreach

LOCAL ORGANIZERS:

Christine Aldala
Beth Demkowski
Edward Diehl
Daniel Levin (co-chair)
Shawn McKee
Jeff McMahon
Michael Schubnell
Thomas Schwarz
Monica Techno (co-chair)

**SCIENTIFIC
PROGRAM COMMITTEE:**

Dan Akerib
Chip Brock
John Carlstrom
Myron Campbell (Chair)
Bonnie Fleming
Nick Hadley
Beattie Heinmann
Klaus Honscheid
Joe Incandella
Daniel Levin
Mike Lindgren
Patricia McBride

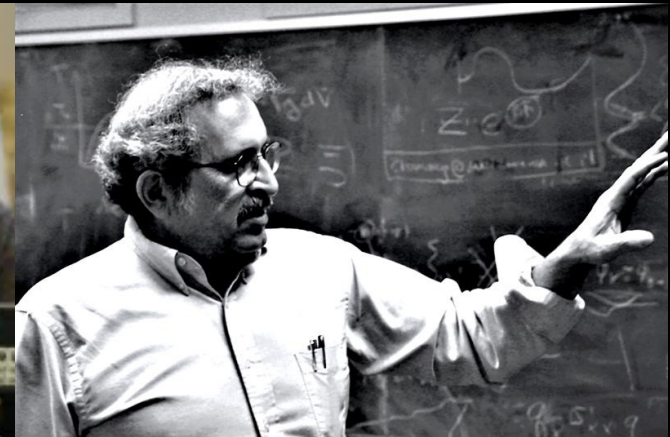
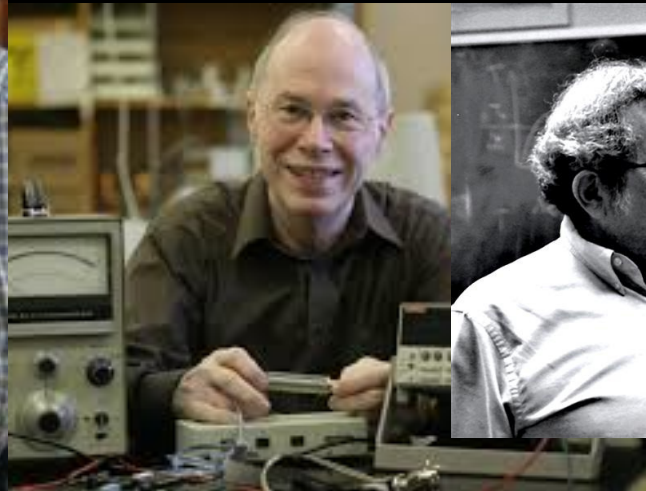
Poster is a draft

**Detailed meeting schedule
early in 2015**



www.physics.lsa.umich.edu/dpf2015

Establishment of an annual award to honor exceptional mentoring.



Establishment of an annual award to honor exceptional mentoring. October 27

This APS Unit Award is intended to recognize DPF members who have had an exceptional impact as mentors of particle physics scientists and students. This mentoring could be through teaching or research or science-related activities and is meant to recognize current achievements as well as those spanning a career.

Examples of contributions honored to include:

Exceptional mentoring of early career particle physicists;

Sustained commitment to mentoring early career particle physicists from traditionally under-represented backgrounds;

A leadership role in developing early career research and career development activities.



Establishment of an annual award to honor exceptional mentoring.

Nominations for the 2015 award will be accepted through Academic Jobs Online (AJO) at <https://academicjobsonline.org/ajo/jobs/4992> through January 15, 2015;

A certificate will be awarded at the DPF Business Meeting during the APS April Meeting; the recipient will be announced again and give an address at the DPF 2015 Meeting in Ann Arbor

Award Committee

Robert Bernstein, FNAL, Chair (rhbob@fnal.gov)

Laura Reina, Florida State University (Vice-Chair)

Benjamin Hooberman, UIUC

Kendall Mahn, Michigan State University

Sally Seidel, University of New Mexico

Contact the Committee if you have questions.



| Object | Weight (tons) |
|---------------------------|---------------|
| Boeing 747 [fully loaded] | 200 |
| Endeavor space shuttle | 368 |
| ATLAS | 7,000 |
| Eiffel Tower | 7,300 |
| USS John McCain | 8,300 |
| CMS | 12,500 |



Many experiments are large and have high costs resulting in major de-scoping of detectors and their capabilities to the detriment of physics reach to match available resources.

Instrumentation frontier

Instrumentation triumph

Instrumentation R&D has the power to transform this situation

ATLAS

DIGITAL CAMERAS THE SIZE OF CATHEDRALS

Snowmass 2013, MN, 8/6 -- J. Shipsey

| Object | Weight (tons) |
|---------------------------|---------------|
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Many experiments are large and have high costs resulting in major de-scoping of detectors and their capabilities to the detriment of physics reach to match available resources.

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Instrumentation Challenge

DIGITAL CAMERAS THE SIZE OF CATHEDRALS

Snowmass 2013, MN, 8/6 -- J. Shipsey

CPAD

Coordinating Panel for Advanced Detectors

- CPAD Membership:
- From Universities
 - Jim Alexander, Cornell
 - Marina Artuso, Syracuse
 - Rick van Berg, U. Penn.
 - Bonnie Fleming, Yale
 - Ulrich Heintz, Brown
 - Howard Nicholson, Mt. Holyoke
 - Gabriella Sciolla
 - Ian Shipsey*, Oxford & Purdue
 - Matt Wetstein, U of Chicago
- From laboratories
 - Clarence Chang, Argonne
 - Marcel Demarteau*, Argonne
 - Juan Estrada, Fermilab
 - David MacFarlane, SLAC
 - Ron Lipton, Fermilab
 - Maurice Garcia-Sciveres, LBNL
 - Vinnie Polychronakos, BNL
 - Erik Ramberg, Fermilab
 - Pete Siddons, BNL
 - Graham Smith, BNL
 - Bob Wagner, Argonne
- International
 - Ariella Cattai, CERN
 - Junji Haba, KEK

<http://www.hep.anl.gov/cpad/>

(*) co-Chair

CPAD Context

CPAD was created by DPF to reinvigorate the national generic R&D instrumentation program within an international context.

Formed in 2012 in response to a key recommendation of the DPF Instrumentation Task Force (Report at HEPAP meeting 10/2011)

DPF strategic decision: recognize the fundamental importance of instrumentation to our field with a Snowmass frontier devoted to instrumentation on the same footing as the energy, intensity and cosmic frontiers with CPAD to organize it

At Snowmass the status of a broad swathe of the generic R&D program was gauged and a number of strategic themes were developed by the community. This has characterized and sharpened the R&D content of a national program in instrumentation



APS DIVISION OF PARTICLES
NEWSLETTER



Currently 10 CPAD Working Groups

- 1) Development and a solicitation of instrumentation grand challenges (based on Snowmass)
- 2) Coordination of instrumentation resources at National Labs for the HEP community
- 3) Creation of a National Instrumentation Fellowship program for post docs & grad. students
- 4) A program to further develop instrumentation schools and education
- 5) The creation of an DPF Award for Excellence in Instrumentation and Development
- 6) Continuation of frequent national instrumentation workshop for the HEP community
- 7) Enhancement of interdisciplinary aspects of instrumentation including a closer relationship with NP, BES, medicine, NASA, & National security
- 8) CPAD input on topics in instrumentation to encourage in the SBIR/STTR proposal calls.
- 9) Establish and maintain a repository of possible new developments in other fields that might benefit the development of new sensors or instrumentation in general.
- 10) Establish an improved model of an equipment pool that could be used for instrumentation development at U.S. universities and labs.

CPAD Report at next HEPAP meeting

DPF & CPAD

Establishment of an annual award to honor exceptional contributions to instrumentation.

CMS

Newsweek

The Biggest Experiment Ever
(And It's European)

ATLAS

Showerclass 2013, MN, 8/6 --I. Shipsey

50

Establishment of an annual award to honor exceptional contributions to instrumentation.

Announcement target date December 15

This APS Unit Award will be given for advancing the field of particle physics through the invention, refinement, or application of instrumentation and detectors. In particular, the award will be given for achievement of one or more of the following:

Conceptualization and development of unique instrumentation that has made a significant impact on the field.

Demonstration of the innovative use of instrumentation.

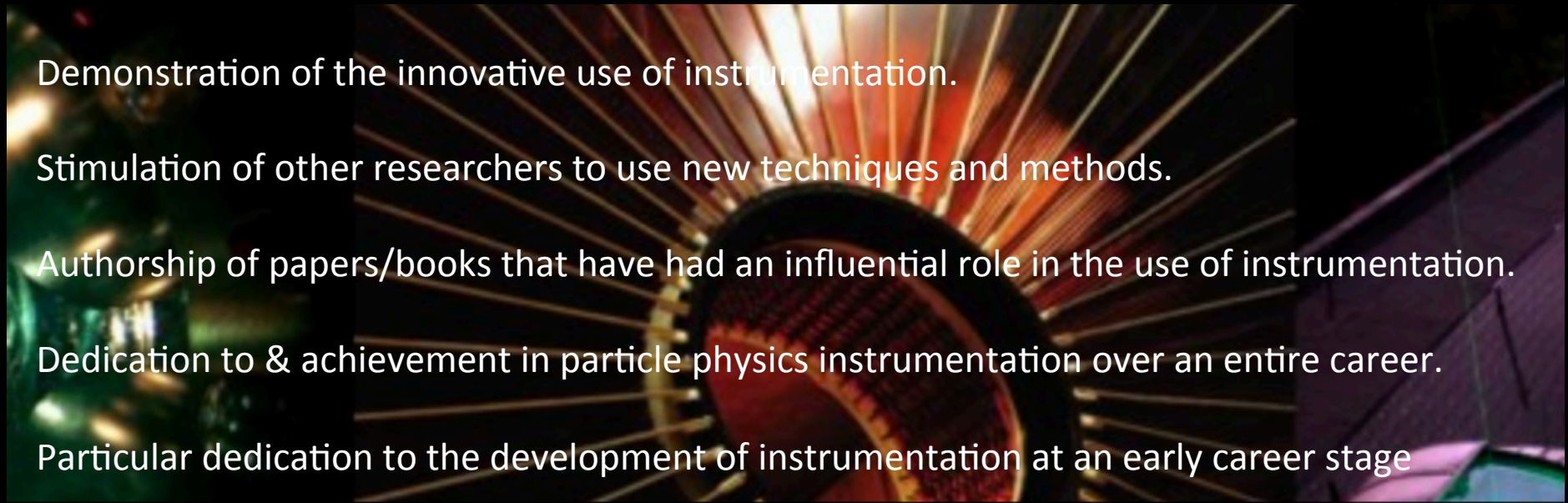
Stimulation of other researchers to use new techniques and methods.

Authorship of papers/books that have had an influential role in the use of instrumentation.

Dedication to & achievement in particle physics instrumentation over an entire career.

Particular dedication to the development of instrumentation at an early career stage

Award selection panel to be drawn for CPAD and DPF membership



New DPF Fellows December 5 2014



Peter Arnold For accomplishments in developing gauge theories at high temperature.

David Asner For his leadership in heavy flavor physics and for his key role in the analysis and interpretation of CLEO data.

Mary Bishai For her contributions to flavor physics, including analysis of the NuMI/MINOS neutrino beam, leadership of the accelerator neutrino program, and contributions to understanding of the b-quark.

Roy Briere For important contributions to the physics of particles containing b and c quarks, crucial to the success of the CLEO and BESIII experiments, and for leadership roles in those experiments.

John Campbell For work in perturbative quantum chromodynamics, especially the precise simulation of standard model processes in high energy particle collisions.

Larry Gladney For his contributions to the study of B physics at the Tevatron and Babar, and for his outstanding efforts in science teaching and outreach programs for middle - and high school students and teachers.



Eva Halkiadakis For her leadership in precision electroweak and top quark measurements at the Tevatron and searches for Supersymmetry at the LHC and for pioneering work in pursuit of new physics in multi-jet final states.

Deborah Harris For leadership in measuring the neutrino reactions that enable current and future accelerator neutrino oscillation experiments.

Jay Hauser For leadership in searches for new phenomena within the CDF and CMS collaborations, and in conception, design, construction, and operation of detector and trigger systems enabling these experiments.

David Kaplan For contributions to models for new physics beyond the Standard Model, collider phenomenology, and dark-matter theory, and for his role as an inventive and effective leader in public outreach.

Wai-Yee Keung For his influential contributions to elementary particle theory, including CP violation and electric dipole moments, Higgs physics, and collider phenomenology



Deborah Harris For leadership in measuring the neutrino reactions that enable current and future accelerator neutrino oscillation experiments.

Jay Hauser For leadership in searches for new phenomena within the CDF and CMS collaborations, and in conception, design, construction, and operation of detectors.

David Morrison For his many contributions to the connection between geometry and physics, including spacetime singularities and topology change in string theory, generalizations of AdS/CFT duality, and foundational work in F theory.

Kevin Pitts For his leading role in heavy-flavor physics at the Tevatron Collider, including the first evidence of CP violation in bottom mesons, and for significant contributions to triggering at the Collider.

Peter Rowson For his leading role in precision electroweak measurements in the SLD detector at the Stanford Linear Collider.

Maria Spiropulu For pioneering searches for supersymmetry and extra dimensions at the Tevatron, innovative searches for new physics and the study of the Higgs boson at the LHC, and key contributions to triggering and data flow for CDF and CMS

**2015 W.K.H. Panofsky
Prize in Experimental
Particle Physics**

Recipient:

[Stanley G. Wojcicki](#)
Stanford University



2015 J.J. Sakurai Prize for Theoretical Particle Physics Recipient

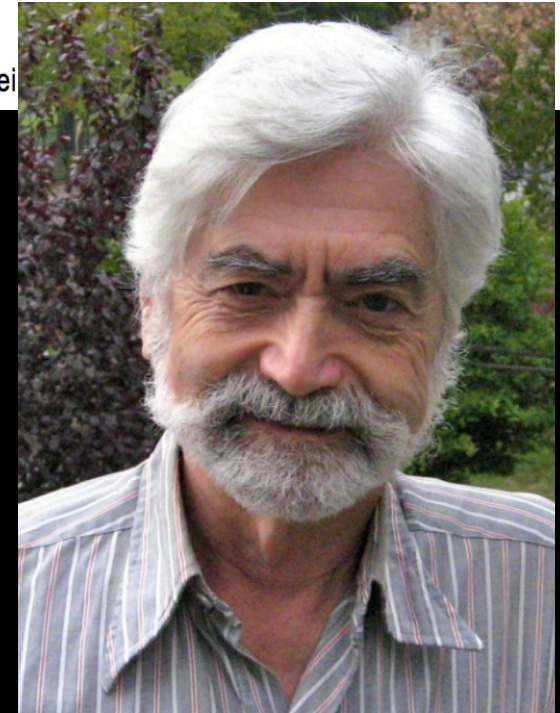
George Zweig
Massachusetts Institute of Technology

Citation:

"For his independent proposal that hadrons are composed of fractionally charged fundamental constituents, called quarks or aces, and for developing its revolutionary implications for hadron masses and properties"

Selection Committee:

Jonathan Feng, Chair; T. Han; S. Martin; A. Nelson; R. Peccei



**2015 Henry Primakoff
Award for Early-Career
Particle Physics
Recipient:**
[Rouven Essig](#)
State University of New
York, Stony Brook



**2014 J.J. and Noriko
Sakurai Dissertation Award
in Theoretical Particle
Physics Recipient:**
[Roberto Vega-Morales](#)



**2013 Mitsuyoshi Tanaka
Dissertation Award in
Experimental Particle
Physics Recipient:**
[David C. Moore](#)
Stanford University



Thanks to the outgoing DPF Executive Members-at-Large

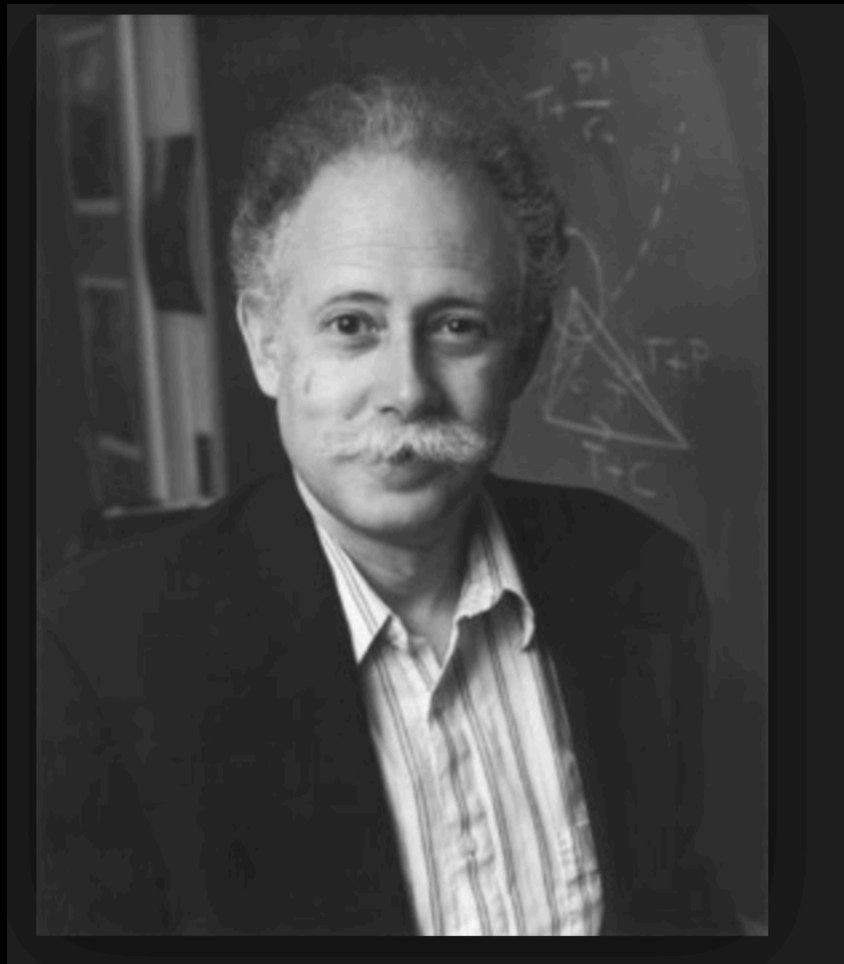


Yuri Gershstein



Nikos Varelas

Thanks to



Jon Rosner DPF vice Chair, Chair Elect, Chair, Past Chair
2011-2014

Particle Physics is Global



Particle Physics is Global



Its also local united across the five science drivers theorists and experimentalists, instrument builders, analysts, accelerator physicists in partnership with the agencies engaging Congress and the public

Particle Physics is Global



Its also local united across the five science drivers theorists and experimentalists, instrument builders, analysts, accelerator physicists in partnership with the agencies engaging Congress and the public to enact the P5 plan

The background of the slide is a reproduction of Michelangelo's famous fresco, "The Creation of Adam," from the ceiling of the Sistine Chapel. The fresco depicts Adam on the left, reclining on a rocky surface, and God on the right, reclining on a cloud. A group of angels surrounds God, and a serpent is visible at the bottom right. The central focus is the gap between Adam's outstretched hand and God's hand, which holds a life-giving spark. The text is overlaid on the central part of the fresco.

"The greater danger for most of us
lies not in setting our aim too high
and falling short; but in setting our
aim too low, and achieving our
mark"

-- Michelangelo

It is a wonderful time to be a particle physicist.

We are privileged to be part of this field at such a historic time.

The public have never been more interested in our field and the excitement continues to build.

We have both wonderful stories to recount to our children and a bright future ahead of us.